TEXAS INSTRUMENTS
HOME COMPUTER

SOLID STATE CARTRIDGE

A self-paced division "tutor" to help your child
develop strong math skills to meet today's and tomorrow's challenges.
Suitable for children from grades three through eight.

18
6
3
3

Quick Reference Guide

To take full advantage of the features and benefits of this cartridge, please read this manual completely. Important keystroke sequences are summarized here for your quick reference.

ENTER   Proceeds to next problem or continues problem after an incorrect answer has been given. Proceeds to the next step of a problem in the "Let Me Help You" feature. Also used to enter Beginning Level and Name.

SPACE BAR   Tells the computer when "?" is in the correct place to begin entering the answer (only when the computer prompts).

Selects short division instead of long division when the computer prompts.

BACK ARROW   Erases answer and starts over.
(← S)

E   Tells the computer you want to quit ("exit") the work session or leave a particular level.

Milliken Math Sequences: Division

This Solid State Cartridge is designed to be used with the Texas Instruments Home Computer. One in a series of twelve cartridges, it can help your child develop the strong math skills needed in today's and tomorrow's world. Suitable for children from grades three through eight.

Programmed by: John Plaster

TEXAS INSTRUMENTS **HOME COMPUTER**

A NOTE TO PARENTS

Children need strong math skills to solve today's and tomorrow's problems. The Milliken Math Sequences, along with the TI Home Computer, can help your child meet these challenges. The series allows children to work at their own pace and on the skill level at which they need practice. Children find that learning with the computer is fun, challenging, and motivating. The computer never tires of repetition or loses patience—it's like having a private math tutor!

The Milliken Math Sequences, developed for Texas Instruments by Milliken Publishing Company, consists of twelve Solid State Cartridges. Each cartridge concentrates on a different skill area in mathematics, such as addition, division, decimals, or fractions. By providing different levels of difficulty, the series is suitable for children from the kindergarten age through grade eight.

The Division cartridge is divided into 64 levels of difficulty, covering material generally taught in grades three through eight. The program provides practice in dividing whole numbers (numbers with no fractional part). Children begin dividing one-digit numbers and advance level by level until they divide with five-digit numbers. Problems are presented both vertically and horizontally, using both ÷ and)⁻ formats.

Beginning at Level 3, your child is given practice at finding the correct place to begin the answer in problems using the)⁻ format. At more difficult levels (Levels 40-64), children work problems with remainders. Beginning at Level 40, your child may choose either long division or short division or use an "erase" option to start the problem over.
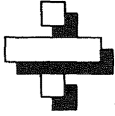
The Division cartridge offers several special features that increase its motivational and reinforcement value:

■ Colorful, rewarding graphics and sound effects that appear in response to correct answers.

■ An unintimidating, try-again approach to incorrect answers.

■ A progress report posted at the bottom of the screen.

■ Periodic reviews to maintain skill mastery.

■ A "help" feature that displays the problem step by step until the final answer is found.

■ Advancement to the next level if problems are answered correctly, or automatic return to a lower level if your child needs more practice.

■ Special practice for finding the correct place to begin an answer.

■ An option for either long or short division at appropriate levels.

■ An optional "erase" function provided at appropriate levels.

■ Report screens personalized with your child's name at the end of each level's activities.

■ An "Exit" screen with a complete report on your child's score at the end of the work session.

YOUR CHILD AND THE COMPUTER

The Texas Instruments computer is a rugged, durable device designed for easy use and care. Teach your child to give the computer the same good care and respect he or she would give a television set, record player, or any piece of electronic equipment:

1. Keep snacks and beverages away from the console.

2. Don't hammer on the keyboard or place heavy objects on it.

3. Don't touch the cartridge contacts. These are recessed in the cartridge to help prevent accidental soiling and/or damage.

The letters and numbers on the keyboard are arranged in the same order found on standard typewriter keyboards. If your child is not familiar with a typewriter or has not used the computer before, take a few minutes to acquaint him or her with the keyboard. Point out the row of number keys at the top and the rows of letter keys below. Show your child how to insert the cartridge and how to select the activities. This brief "tour" of the computer will help reinforce the correct procedures for your child and instill confidence as he or she starts out in a new world of computers.

Today computers are involved in almost every aspect of life. Working with this cartridge can help your child become familiar with computers and their operation. Since computer-aided instruction is more common in the classroom every year, this knowledge can give your child an important advantage.
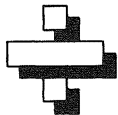
USING THE SOLID STATE CARTRIDGE

An automatic reset feature is built into the computer. When a cartridge is inserted into the console, the computer returns to the master title screen. All data or program material you have entered will be erased.

Note: Be sure the cartridge is free of static electricity before inserting it into the computer (see page 18).
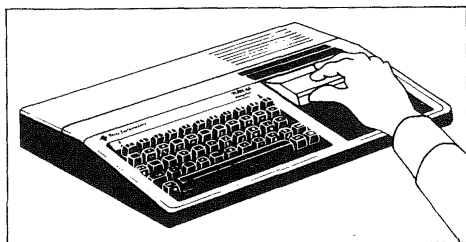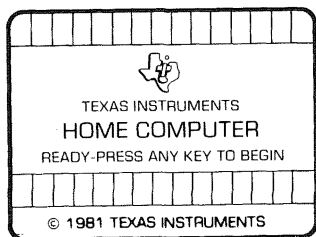
1. Turn the computer ON, and wait for the master title screen to appear. Then slide the cartridge into the slot on the console.

2. Press any key to make the master selection list appear. To select the cartridge, press the key corresponding to the number beside MILLIKEN on the list.

Note: To remove the cartridge, *first* return the computer to the master title screen by pressing **QUIT**. *Then* remove the cartridge from the slot. If you have any problem inserting the cartridge, or if it is accidentally removed from the slot while in use, please see "In Case of Difficulty" on page 18.

A SAMPLE ACTIVITY

For easy use, directions are displayed on the screen throughout all the levels. This sample activity, however, can help to illustrate the way the program works.

Let's Begin

When the Milliken title screen appears, press any key to begin. The screen then prompts you to enter the Beginning Level. Select any level from 1 to 64 by typing the number and then pressing ENTER. For this example, press 2 and ENTER. Next, the screen asks for Name. Type your child's name (up to ten letters long) and press ENTER.

Now a division problem is displayed on the screen. A flashing question mark shows where the answer will go, and the directions on the screen tell you to "Enter the correct number." A progress report appears across the bottom of the screen, with the following meanings:

PL   = Problem Level
TC   = Total Correct
TP   = Total Problems
AVG = Average

As your child works through the problems, these figures are updated to report his or her progress. TC, TP, and AVG are automatically reset to zero at the beginning of each level.

How the Computer Responds

Let your child answer a few problems as you observe. He or she simply presses the correct number from the top row of keys. If the problem is answered correctly, an animated picture appears. Your child then presses ENTER to continue to the next problem.

If the problem is answered incorrectly, the computer returns a screen message and encourages your child to press ENTER to try again. If a second incorrect answer is given, the screen border turns red and flashes. To continue, your child presses ENTER again, and the computer gives the answer, with a message to "Study the Answer." When your child presses ENTER again, the next problem appears. In more complex problems which involve several steps, your child is given more chances to answer correctly.
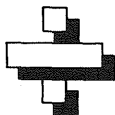
Advancing or Moving Back

If your child answers five of the previous six problems correctly, a "Good News" report is displayed. He or she then advances to the next level. If three problems in a row are answered incorrectly, a "Bad News" report appears, and your child moves back one level.

Changing Levels

You can change levels any time the question mark is flashing. To leave this level, simply press the letter E for "exit." An "Exit" screen appears, which reports on your child's progress. Press **ENTER** to return to the title screen.

Let's try another level. Press any key to go to the "Levels 1-64" screen. This time, enter **40** as the Beginning Level. Then type your child's name again, and press **ENTER** to continue.

Finding the Correct Place

At Level 40 a small moving question mark appears at the top of the problem. Your child must decide at what place to begin entering the quotient (answer). Press the **SPACE BAR** when the "?" is in the right place.

Entering Numbers

In problems using the $\overline{)}$ format, quotients are entered from left to right, long division computation values are entered right to left, and remainders (to the right of the quotient) are entered left to right. In other words, problems are solved just as they would be in the traditional pencil-and-paper method. This method reinforces the correct order of problem solution.

Long Division or Short Division

After typing the first digit of the quotient, the directions "Press SPACE BAR for short division" appear. Short division is offered because your child may wish to do the computation mentally. To use the short division option, press the **SPACE BAR** when instructed on the screen and enter the quotient. The short division option is offered whenever appropriate in Levels 40 through 64.

To use long division, do not press the **SPACE BAR**, but simply do the computation on the screen. Watch the flashing "?" and enter the appropriate values—even if the value is zero.

Erasing with the Back Arrow

At the same time the short division option is offered, the directions "Press BACK ARROW to try a new number" also appear. If your child finds that he or she has typed an incorrect digit in the quotient, the **BACK ARROW (S** key) can be used to erase and start over.

"Let Me Help You"

Now let's try the "Let Me Help You" feature. On the next problem, deliberately enter wrong answers until the border flashes red. Press **ENTER** and the message "Let Me Help You" is displayed. Keep pressing **ENTER** as the computer completes the problem step by step, including long division and remainder, until the final answer is found. Thus, if your child has difficulty with a particular problem, the computer demonstrates the solution.

Continue to observe as your child works through the problems and gains familiarity with the program's operations.
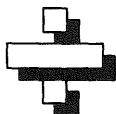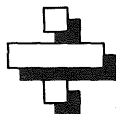
SKILL LEVELS

This chart can help you find the appropriate starting level for your child. By looking at the sample problems and the skill description, select a level that is not too easy, but also not too difficult, for him or her. If in doubt, start at a lower level and work up from there. You may wish to select a REVIEW level first to see if your child has mastered the skill levels up to that point. A glossary is provided on page 17.

$$\text{DIVIDEND} \div \text{DIVISOR} = \text{QUOTIENT} \quad \text{DIVISOR} \overline{)\ \overset{\text{QUOTIENT}}{\text{DIVIDEND}}}$$

Level	Sample Problem	Skill Description
1	$? \times 2 = 10$	Finding missing factors from 0 through 9. Multiplicands from 1 through 2; products from 0 through 20.
2	$14 \div 2 = ?$	Dividing horizontally and vertically. Quotients from 0 through 9. Divisor is 2; dividends from 0 through 18 (multiples of
3	$2 \overline{)\ \overset{?}{8}}$	2).
4	$? \times 5 = 15$	Finding missing factors from 0 through 9. Multiplicand is 5; products from 0 through 45 (multiples of 5).
5	$35 \div 5 = ?$	Dividing horizontally and vertically. Quotients from 0 through 9. Divisor is 5; dividends from 0 through 45 (multiples of
6	$5 \overline{)\ \overset{?}{20}}$	5).

TEXAS INSTRUMENTS **HOME COMPUTER**

Level	Sample Problem	Skill Description
7 8	$20 \div 5 = ?$ $2\overline{)\ 18}^{\ ?}$	REVIEW: quotients from 1 through 9. Divisor is 2 or 5; dividends from 2 through 45 (multiples of 2 or 5).
9	$? \times 10 = 80$	Finding missing factors from from 0 through 9. Multiplicand is 10 or 1; products from 0 through 9 and from 10 through 90 (multiples of 10).
10 11	$8 \div 1 = ?$ $10\overline{)\ 70}^{\ ?}$	Dividing horizontally and vertically. Missing quotients from 1 through 9. Divisor is 1 or 10; dividends from 1 through 9 and from 10 through 90 (multiples of 10).
12-13 14-15	$80 \div 10 = ?$ $5\overline{)\ 35}^{\ ?}$	REVIEW: quotients from 1 through 9. Divisors are 1, 2, 5, and 10; dividends from 1 through 9, 2 through 18, 5 through 45, and 10 through 90 (multiples of the divisor).
16	$? \times 3 = 27$	Finding missing factors from 0 through 9. Multiplicand is 3; products from 0 through 27 (multiples of 3).

Level	Sample Problem	Skill Description
17	$9 \div 3 = ?$	Dividing horizontally and vertically. Quotients from 1 through 9. Divisor is 3; dividends from 3 through 27 (multiples of 3).
18	$3\overline{)\ 18}$ $\overset{?}{}$	
19	$? \times 4 = 32$	Finding missing factors from 0 through 9. Multiplicand is 4; products from 0 through 36 (multiples of 4).
20	$24 \div 4 = ?$	Dividing horizontally and vertically. Missing quotients from 1 through 9. Divisor is 4; dividends from 4 through 36 (multiples of 4).
21	$4\overline{)\ 16}$ $\overset{?}{}$	
22	$18 \div 2 = ?$	REVIEW: quotients from 1 through 9. Divisors from 1 through 5, and 10; dividends to 90.
23	$5\overline{)\ 35}$ $\overset{?}{}$	
24	$? \times 6 = 24$	Finding missing factors from 0 through 9. Multiplicand is 6; products from 0 through 54 (multiples of 6).
25	$42 \div 6 = ?$	Dividing horizontally and vertically. Quotients from 1 through 9. Divisor is 6; dividends from 6 through 54 (multiples of 6).
26	$6\overline{)\ 48}$ $\overset{?}{}$	

TEXAS INSTRUMENTS **HOME COMPUTER**

Level	Sample Problem	Skill Description
27	$? \times 7 = 42$	Finding missing factors from 0 through 9. Multiplicand is 7; products from 0 through 63 (multiples of 7).
28	$56 \div 7 = ?$	Dividing horizontally and vertically. Quotients from 1 through 9. Divisor is 7; dividends 7 through 63 (multiples of 7).
29	$7 \overline{)\ 28}$	
30	$? \times 8 = 0$	Finding missing factors from 0 through 9. Multiplicand is 8; products from 0 through 72 (multiples of 8).
31	$24 \div 8 = ?$	Dividing horizontally and vertically. Quotients from 1 through 9. Divisor is 8; dividends from 8 through 72 (multiples of 8).
32	$8 \overline{)\ 72}$	
33	$? \times 9 = 72$	Finding missing factors from 0 through 9. Multiplicands is 9; products from 0 through 81 (multiples of 9).
34	$54 \div 9 = ?$	Dividing horizontally and vertically. Quotients from 1 through 9. Divisor is 9; dividends from 9 through 81 (multiples of 9).
35	$9 \overline{)\ 45}$	
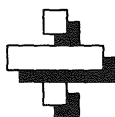
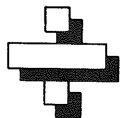| Level	Sample Problem	Skill Description
36-37	$27 \div 3 = ?$	REVIEW: quotients from 1 through 9. Divisors from 1 through 10; dividends through 90. No remainders.
38-39	$\begin{array}{r} ? \\ 8\overline{)\,56} \end{array}$	
40	$\begin{array}{r} ? \\ 2\overline{)\,17} \end{array}$	Doing long or short division. Quotients from 1 through 9. Divisors from 2 through 9; dividends from 10 through 19. Remainders possible.
41	$\begin{array}{r} ? \\ 8\overline{)\,70} \end{array}$	Doing long or short division. Quotients from 1 through 9. Divisors from 2 through 9; dividends from 10 through 89. Remainders possible.
42	$\begin{array}{r} ?? \\ 3\overline{)\,69} \end{array}$	REVIEW: Quotients from 10 through 39. Divisors from 2 through 9; dividends from 10 through 99. No remainders.
43	$\begin{array}{r} ?? \\ 3\overline{)\,97} \end{array}$	Doing long or short division. Quotients from 10 through 39. Divisors from 2 through 9; dividends from 10 through 99. Remainders possible.

Level	Sample Problem	Skill Description
44	? 7) 23	Doing long or short division. Quotients from 1 through 39. Divisors from 2 through 9; dividends from 1 through 99. Remainders possible.
45	??? 2) 484	Doing long or short division. Quotients from 100 through 499. Divisors from 2 through 9; dividends from 100 through 999. No remainders.
46	?? 3) 256	Doing long or short division. Quotients from 10 through 99. Divisors from 2 through 9; dividends from 100 through 999. Remainders possible.
47	??? 5) 806	Doing long or short division. Quotients from 100 through 499. Divisors from 2 through 9; dividends from 100 through 999. Remainders possible.
48	???? 3) 9636	Doing long or short division. Quotients from 1000 through 4999. Divisors from 2 through 9; dividends from 1000 through 9999. No remainders.

Level	Sample Problem	Skill Description
49	??? 8) 3468	Doing long or short division. Quotients from 100 through 999. Divisors from 2 through 9; dividends from 1000 through 9999. Remainders possible.
50	???? 7) 8234	Doing long or short division. Quotients from 1000 through 4999. Divisors from 2 through 9; dividends from 1000 through 9999. Remainders possible.
51	??? 4) 3189	REVIEW: quotients from 100 through 4999. Divisors from 2 through 9; dividends from 1000 through 9999. Remainders possible.
52	?? 30) 690	Doing long or short division. Quotients from 1 through 99. Divisor is 10, 20, 30, or 40; dividends from 100 through 990. No remainders.
53	? 20) 47	Doing long or short division. Quotients from 1 through 9. Divisors from 10 through 90 (multiples of 10); dividends from 10 through 99. Remainders possible.

TEXAS INSTRUMENTS **HOME COMPUTER**

Level	Sample Problem	Skill Description
54	$30\overline{)778}$??	Doing long or short division. Quotients from 10 through 99. Divisors from 10 through 90 (multiples of 10); dividends from 100 through 999. Remainders possible.
55	$60\overline{)4873}$??	Doing long or short division. Quotients from 10 through 999. Divisors from 10 through 90 (multiples of 10); dividends from 1000 through 9999. Remainders possible.
56-57	$74\overline{)138}$?	Doing long or short division. Quotients from 1 through 9. Divisors from 10 through 99; dividends from 10 through 199. Remainders possible.
58-59	$38\overline{)734}$??	Doing long or short division. Quotients from 10 through 99. Divisors from 10 through 99; dividends from 100 through 999. Remainders possible.
60	$39\overline{)247}$?	Doing long or short division. Quotients from 1 through 99. Divisors from 10 through 99; dividends from 100 through 999. Remainders possible.

Division

Level	Sample Problem	Skill Description
61	?? 54) 2468	Doing long or short division. Quotients from 10 through 99. Divisors from 10 through 99; dividends from 1000 through 9899. Remainders.
62-64	??? 47)36782	Doing long or short division. Quotients from 100 through 999. Divisors from 10 through 99; dividends from 1000 through 98,999. Remainders.

GLOSSARY

digit: Any of the numerals 0 to 9; for example, the numeral "986" has three digits.

dividend: A number that is divided by another.

divisor: A number by which another number is divided.

factor: Any numbers that when multiplied together form a product. Multiplicands and multipliers are both factors.

multiple: A number into which another can be divided with zero remainder.

multiplicand: A number that is multiplied by another.

multiplier: A number by which another number is multiplied.

product: The result of two numbers multiplied together; for example, MULTIPLIER × MULTIPLICAND = PRODUCT

quotient: The result of one number divided by another; for example, DIVIDEND ÷ DIVISOR = QUOTIENT

remainder: After division, the final undivided part that is less than the divisor.

TEXAS INSTRUMENTS **HOME COMPUTER**

CARING FOR THE CARTRIDGE

These cartridges are durable devices, but they should be handled with the same care you would give any other piece of electronic equipment. Keep the cartridge clean and dry, and don't touch the recessed contacts.

CAUTION:
The contents of a Solid State Cartridge can be damaged by static electricity discharges.

Static electricity build-ups are more likely to occur when the natural humidity of the air is low (during winter or in areas with dry climates). To avoid damaging the cartridge, just touch any metal object (a doorknob, a desklamp, etc.) before handling the cartridge.

If static electricity is a problem where you live, you may want to buy a special carpet treatment that reduces static build-up. These commercial preparations are usually available from local hardware and office supply stores.

IN CASE OF DIFFICULTY

If the cartridge activities do not appear to be operating properly, return to the master title screen by pressing **QUIT**. Withdraw the cartridge, align it with the cartridge opening, and reinsert it carefully. Then press any key to make the master selection screen appear. (*Note:* In some instances, it may be necessary to turn the computer off, wait several seconds, and then turn it on again.)

If the cartridge is accidentally removed from the slot while the cartridge contents are being used, the computer may behave erratically. To restore the computer to normal operation, turn the computer console off, and wait a few seconds. Then, reinsert the cartridge, and turn the computer on again.

If you have any difficulty with your computer or cartridge, please contact the dealer from whom you purchased the unit and/or cartridge for service directions.

Additional information concerning use and service can be found in your *User's Reference Guide*.

THREE-MONTH LIMITED WARRANTY
HOME COMPUTER SOFTWARE CARTRIDGE

Texas Instruments Incorporated extends this consumer warranty only to the original consumer purchaser.

WARRANTY COVERAGE

This warranty covers the electronic and case components of the software cartridge. These components include all semiconductor chips and devices, plastics, boards, wiring and all other hardware contained in this cartridge ("the Hardware"). This limited warranty does not extend to the programs contained in the software cartridge and in the accompanying book materials ("the Programs").

The Hardware is warranted against malfunction due to defective materials or construction. **THIS WARRANTY IS VOID IF THE HARDWARE HAS BEEN DAMAGED BY ACCIDENT, UNREASONABLE USE, NEGLECT, IM-PROPER SERVICE OR OTHER CAUSES NOT ARISING OUT OF DEFECTS IN MATERIALS OR WORKMANSHIP.**

WARRANTY DURATION

The Hardware is warranted for a period of three months from the date of the original purchase by the consumer.

WARRANTY DISCLAIMERS

ANY IMPLIED WARRANTIES ARISING OUT OF THIS SALE, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED IN DURATION TO THE ABOVE THREE-MONTH PERIOD. TEXAS INSTRUMENTS SHALL NOT BE LIABLE FOR LOSS OF USE OF THE HARDWARE OR OTHER INCIDENTAL OR CONSE-QUENTIAL COSTS, EXPENSES, OR DAMAGES INCURRED BY THE CONSUMER OR ANY OTHER USER.

Some states do not allow the exclusion or limitation of implied warranties or consequential damages, so the above limitations or exclusions may not apply to you in those states.

LEGAL REMEDIES

This warranty gives you specific legal rights, and you may also have other rights that vary from state to state.

PERFORMANCE BY TI UNDER WARRANTY

During the above three-month warranty period, defective Hardware will be replaced when it is returned postage prepaid to a Texas Instruments Service Facility listed below. The replacement Hardware will be warranted for three months from date of replacement. Other than the postage requirement, no charge will be made for replacement.

TI strongly recommends that you insure the Hardware for value prior to mailing.
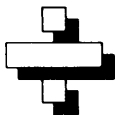
TEXAS INSTRUMENTS CONSUMER SERVICE FACILITIES

IMPORTANT NOTICE OF DISCLAIMER REGARDING THE PROGRAMS

Texas Instruments invented the integrated circuit,
the microprocessor, and the microcomputer.
Being first is our tradition.

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